

3. Those who still hold to radical operation will find the responsibility harder to shoulder with the ever-increasing recognition of the fact that tuberculous adenitis can be cured without it.

4. Hard, fibrous nodules following radiotherapy seldom ever contain any tuberculous foci, but it may be advisable to remove these nodules through a small incision the same as a foreign body.

5. It is to be remembered that large cervical glands may be due to sarcoma, Hodgkin's disease, leukemia, etc., and that radiotherapy is still the best form of treatment for multiple glandular tumors, but the end-results are not the same as when the enlargement is due to tuberculosis.

6. In the treatment of tuberculous adenitis in the future, when a more systematic raying is employed and when the cases are referred earlier, this method of treatment will be universally accepted.

SOME CONSIDERATIONS IN CONNECTION WITH GALL-BLADDER DISEASE.¹

By TRUMAN G. SCHNABEL, M.D.,

INSTRUCTOR IN MEDICINE, UNIVERSITY OF PENNSYLVANIA.

SOMEONE has styled the left border of the sternum in its cardiologic relationship as the romantic area. If one might apply this phrase to the abdomen, few would disagree that the right upper quadrant is deserving of the same characterization. It is quite true that many times the diagnostic story in the right hypochondrium is told in a very real manner, but all too often little respect is shown for the truth and much is left to the imagination.

In this comparatively small area, easily covered by the outstretched hand, are found the antral portion of the stomach with the pylorus, the duodenum, the biliary system, including the gall-bladder, the head of the pancreas, the right kidney, the ascending colon and the hepatic flexure, to say nothing of the appendix. This close anatomic relationship alone is sufficient to explain the problems in differential diagnosis encountered in this region. Besides this the more or less common nerve supply going to all of these structures, sympathetic and vagal in origin, increases the diagnostic troubles many times. A lesion in any one has its reference in one or all of the other organs. This alliance seems to be especially close between the gall-bladder and the stomach. The relationship of the intercostal nerve supply to the abdominal wall and the splanchnic innervation to the underlying viscera explains the upper right rectus rigidity when it spreads its protective cover over each one of these

¹ Read at a meeting of the Northampton County Medical Society, Easton, Pa.

structures as it becomes involved in some inflammatory process. Further diagnostic difficulty is met with by the presence of an abdominal reference which supradiaphragmatic lesions have in the right upper quadrant, and we need not be reminded that the reverse is also true. How convinced is many a cardiac that his trouble is subdiaphragmatic and how often does the victim of a gall-bladder or gastric attack believe that his lesion is in or about the heart. A common embryologic origin with a similar blood supply also offers an excuse for additional diagnostic puzzles that arise in the gastro-duodeno-hepatico-pancreatic system as it has been styled by McCarty.

As we are prepared in our medical schools we hear at least two or three times more about chest diagnosis than about abdominal methods of investigation. The new house doctor too often makes the physical examination note "abdomen negative," which usually means that he is more or less at sea in abdominal diagnosis. Of course it is more sensational and at the same time easier to demonstrate a good presystolic rumble than it is to palpate a spastic colon, and it is more impressive to hear a metallic tinkle than it is to outline an air-distended stomach. All of which means that an especially difficult field of diagnosis is rendered more so by a failure to stress the abdomen in our undergraduate teaching.

We said that the gall-bladder is in this complex upper right abdomen, and it is superfluous to say to you who have had your baptism of fire that its lesions, their etiology, pathology, symptomatology, diagnosis and treatment, furnish some of the most baffling and at the same time most interesting of medical problems. It is not our purpose to make a formal presentation in the matter of gall-bladder diseases but rather to point the way to a profitable mutual discussion of the subject.

The most interesting diseases of the gall-bladder are cholecystitis and cholelithiasis. Other lesions are comparatively rare and almost impossible of clear-cut diagnosis. That these two conditions are usually present at the same time needs little emphasis, and that either can exist alone is difficult of refutation. We still believe that the leading etiological rôle in these diseases is an infectious one, and that stones are consequent upon the precipitation of cholesterolin, bile salts, lime salts and other substances around some nidus, usually desquamated epithelium or bacteria. Just how this precipitation is accomplished is uncertain. The inflammatory lesion is always, we believe, bacterial in origin, and as Rosenow and others have shown, the streptococcal and colon group are the chief offenders. The typhoid bacillus no longer assumes the important rôle of earlier days as Chauffard and others have shown. There are those who champion an inflammatory lesion of the gall-bladder due to some chemical change in the bile; and there are those who speak very knowingly of biliary stasis and gall-stone formation. Another

group adhere strongly to the belief that a hypercholesterinemia of chronic or acute variety is responsible for stone-production. There is no good evidence, however, to show that an increased blood cholesterol, *per se*, is constantly associated with or responsible for cholelithiasis. Indeed, the testimony in the matter of this monatomic alcohol and its relationship in the animal economy, whether normal or pathologic, is very uncertain and conflicting. It is quite true that single stones, usually pure cholesterin, are found with no inflammatory lesion in the biliary tract; but then too, there is every reason to believe that inflammation and its bacterial origin may be completely erased in these structures as it can be in others. The factors of abdominal trauma, ptotic viscera and pregnancy make for interesting etiologic discussion. The increased incidence of gall-stones in women, of course, lends support to the correctness of these theories. All must know of the phrase "fair, fat and forty." It is quite true that a thin wiry type, especially in the male, seldom yields a gall-bladder diagnosis, and it is equally true that these lesions are emphasized with advancing age and increasing inactivity, but we can fairly assume that their origin goes back to an earlier day. There is then, we believe, no single etiologic theory that holds for all cases of gall-bladder disease. Each case, in all probability, has its own particular history.

It is largely artifice that leads to a distinction between cholangitis and cholecystitis. Usually the whole biliary tract is involved in an infectious process and it is difficult to conceive how the ducts may be affected and the gall-bladder remain free, or *vice versa*. The very close relationship between the integral parts of the biliary system makes it doubtful whether clinically a differential diagnosis can be made between a duodenitis, choledochitis, cholecystitis and a hepatitis; and, furthermore, this close interrelationship would seem to demonstrate the futility of taking out a gall-bladder in some cases if the ducts too are involved in the infectious process.

We shall not tarry in the matter of the pathology of gall-bladder disease nor with the stereotyped discussion of the composition of gall-stones. We might do the same for symptomatology, still there are some points deserving emphasis in this direction. These include the fact that the clinical picture varies in wide degree with the extent and severity of the lesion and the presence or absence of infection in combination with lithiasis. Initial nausea and vomiting, fever, pain and tenderness over Murphy's point, tenderness at the tip of the right eleventh rib, muscular rigidity and a large and tender gall-bladder constitute the story for vesical inflammation. With subsiding gall-bladder attacks there may only be tenderness in the right costovertebral angle as pointed out by Sailer. Jaundice may be present and a leukocytosis is a rather constant finding. Adding colic to this picture may make for a stone diagnosis, but such colicky pain may be attributable at times to cholecystitis alone. The pres-

ence of stones usually is productive of a picture of chronic inflammation manifested by long-continued or recurring attacks of indigestion. The symptoms are usually paroxysmal in type and may be most severe.

Gall-stone colic is variable in character. The history of a sudden, severe, agonizing pain in the right hypochondrium or epigastrium, and rarely in the left hypochondrium radiating to the chest or to either scapula, nausea, vomiting, prostration, weak rapid pulse, sweating, etc., generally labels such an attack as stone.

Colicky pains usually have their origin in one of these ways:

1. Adhesions of a gall-bladder no longer containing stones.
2. Adhesions when large stones are present in the gall-bladder and the cystic duct is patent.
3. Inflammatory processes in a gall-bladder distended by fluid or stones when the cystic duct is occluded by inflammation or by the presence of a stone in the neck of the gall-bladder.
4. The transit of a stone through the bile passages.
5. Inflammation of a dilated calculous common duct or its tributaries without impaction by stone. Jaundice in these conditions always is a variable feature dependent, in fact and degree, upon the relative completeness of bile obstruction.

Whether or not gall-stones can be latent occupies much discussion in the literature. Probably a careful anamnesis would always develop in the postmortem quiescent stone patient the story of "stomach trouble," "indigestion," "dyspepsia," etc. On the other hand there is evidence to show that innocent stones are not a myth, and that, too, in well-observed cases. Clark reported 86 incidental gall-stone cases in connection with pelvic operations including 19 cases absolutely free of symptoms referable to the biliary tree.

A thickened cicatrized gall-bladder manifestly is not palpable and must be interpreted in the light of Courvoisier's law as being due to stone impaction. The other half of the law implies that a chronic palpable gall-bladder is consequent upon some extra duct obstruction, such as carcinoma of the head of the pancreas, etc. We need not dwell upon the Charcot type of intermittent fever in connection with these cases. Common duct, and cystic duct obstruction by stones are followed by many interesting conditions.

It is an easy matter to draw pictures for didactic purposes, but unfortunately disease does not always run true to type. All that may be said about diagnosis fails in certain cases. Volumes might be written on the various differential possibilities over against gall-bladder disease. I shall be content with merely mentioning some of them: gastroduodenal ulcer, appendicitis, renal calculus, intestinal obstruction, dilated duodenum due to ligamentous adhesions at the duodenojejunal junction, crises of tabes, cardiac lesions, especially with decompensation and angina pectoris; pneumonia, aortic aneurysm, Pott's disease, visceroptosis, abdominal adhesions,

pancreatitis, peritonitis, lead colic, twisted ovarian pedicle, etc. The picture of gall-bladder disease is much altered by neighborhood adhesions of the thick variety or even by actual adhesions of the gall-bladder to the duodenum, pylorus, pancreas and colon.

Can we expect any diagnostic assistance from the roentgen ray? In a variable percentage of cases gall-stone shadows are obtained. Some roentgenologists claim this percentage as high as 50 while a conservative estimate must be placed at 20 per cent. The demonstration of diseased gall-bladders is likewise a procedure of uncertainty and great difficulty. Some roentgenologists claim 25 per cent. accuracy in this direction while others are not as sanguine. It is the calcium salts, of course, that cast the stone shadows.

We have suggested that there is no good evidence to show that gall-stone formation results from a hypercholesterinemia, *per se*, and that the evidence in the literature is contradictory on this point. Our own experience leads us to believe that blood cholesterol estimations confuse rather than clear up a gall-bladder diagnosis. Hypercholesterinemic figures are obtained in lesions other than biliary ones and the results obtained for a given disease are inconstant in individual cases and variable in a group of identical cases. It is quite likely that hypercholesterinemia and an increase in bile cholesterol are factors in gall-stone formation, but we have not as yet solved the pathologic physiology.

The examination of the duodenal contents offers a promising means of arriving nearer the truth in gall-bladder disease than many things thus far suggested. The technic is rather long and tedious, requiring extensive experience in the matter of interpretation. The best results are obtained by passing an approximately sterile duodenal tube into the fasting stomach; 75 to 80 cm. of the tube are swallowed and the patient lies on the right side. Sometimes elevation of the pelvis facilitates the passage of the capsule into the duodenum. This procedure is preceded by an attempt at sterilization of the upper respiratory tract by Dobell's solution or spraying and gargling with some antiseptic solution, *e. g.*, a potassium permanganate solution, 1 gr. to the ounce. The stomach, too, is washed out by a liquor antisepticus alkalinus solution in the continual secretion cases and weak hydrochloric acid solutions are used in the subacid cases. A variable amount of time is required for the tube to pass over into the duodenum, but when it does so a bile-tinged return may or may not be obtained. The tap should be alkaline. This technic accords with that utilized by Lyon, who recently gave the investigation of the duodenal contents an added stimulus and emphasized the contentions made by Einhorn and others a number of years ago.

In 1916, at the meeting of the American Gastro-enterological Society, Meltzer promulgated his theory of contrary innervation as applied to the biliary apparatus. In a footnote attached to this

report he says: "I make, therefore, the suggestion to test in jaundiced and biliary colic a local application of a 25 per cent. solution of magnesium sulphate by means of the duodenal tube. It may relax the sphincter of the common duct and permit the ejection of bile and perhaps even the removal of a calculus of moderate size, wedged in the duct in front of the papilla of Vater." Lyon took advantage of this footnote and now douches the duodenum with a 25 per cent. magnesium sulphate solution, which is followed frequently by a richly colored return flow of bile through the duodenal tube. The examination of this bile chemically, bacteriologically and cytologically affords a possible means for better diagnosis in a limited number of cases. These include the extensive inflammatory lesions along the biliary tract as well as the common and cystic duct obstruction cases. In the former cases the presence of an excessive amount of degenerated epithelium, leukocytes and an unusually rich bacteriology serves as a criterion for a positive infection diagnosis. If no bile whatever is obtained when the duodenal capsule is properly placed we may assume common duct obstruction, and if no dark colored bile is returned after Epsom salts douching a blocked cystic duct or a functionless gall-bladder may be inferred.

This procedure of tapping and douching the duodenum affords a diagnostic aid and may be a means of treating infectious processes along the biliary tract. The use of other substances than magnesium sulphate, such as olive oil, calomel solutions, a 2 per cent. solution of hydrochloric acid and a cup of bouillon, serves to call forth an abundant bile drainage. This drainage method becomes a seemingly rational means of treating, *e. g.*, acute catarrhal jaundice. Weak antiseptic solutions of argyrol or ichthyol, as suggested by Einhorn, may be utilized daily in a therapeutic way through the duodenal tube.

We find that little stress can be laid upon the gross appearance of duodenal tube bile as indicating normality or pathology. A turbid bile may be found in continuous gastric secretion cases when there is no gall-bladder lesion. A weak hydrochloric acid solution serves to render a bile solution cloudy. In our experience bile of all colors, viscosity and transparency may be obtained in normal cases. We do not subscribe to the possibility of diagnosing differentially by this means a duodenitis, cholecystitis, choledochitis or a hepatitis. The duodenum receives the gastric, biliary, pancreatic and duodenal secretions and to segregate them seems well-nigh impossible. The bacteriology of duodenal taps require careful study and involves a most difficult and uncertain field of study. Many organisms are reported as being obtained normally and pathologically. We have principally found members of the colon group. The pneumococcus is reported by some men. Just how this fact can be reconciled with the general bile solubility of this organism is difficult for a non-bacteriologist to explain.

The rôle of the gall-bladder as a focus of infection in extrabiliary pathology is deserving of much thought. In our experience we have noted very little influence derived from excision of a diseased gall-bladder in such cases as multiple arthritis. Generally these cases are well advanced when this is tried and naturally very little can be done. As a matter of fact the subject of focal infection is a many-sided and complex one, so that it is dangerous to draw conclusions even on an extensive experience in this field.

It has been both unfortunate and fortunate at the same time that in recent years there has been a domination of our ideas by surgical conceptions. In the matter of gall-bladder disease, as well as in other conditions, the viewpoints of the family doctor, the gastro-enterologist and the surgeon are different, and therefore their conclusions do not harmonize. The general practitioner sees the first attack of cholecystitis and sees many such bladders yield to ordinary medical procedures never again to cause trouble. The gastro-enterologist sees the chronic dyspeptic and the surgeon in his turn sees well-advanced pathology. We know of nothing that will influence the fate of gall-stones other than surgery, but we do not believe that primary attacks of cholangitis or cholecystitis belong to this therapeutic field. We do assign to the surgeon gall-bladder disease of early chronicity because of the frequent tenacious persistence of infection in the gall-bladder wall and surrounding lymphatic system. This affords the possibility of a focus of infection for other parts of the body as well as fresh outbreaks in the biliary tract itself. Drainage by way of the duodenal tube and even by cholecystostomy can offer no hope in the chronic case with gall-bladder wall infection; indeed, duodenal tube installations in any event can offer little advantage over the time-honored method of taking Epsom salts by mouth.

Whether or not the operation is to be one of cholecystostomy or cholecystectomy offers a fine opportunity for sound judgment on the part of the operator. Both procedures are followed by successes, by failures and by reformed or overlooked stones. Routine cholecystectomies are to be condemned as all routine treatment should be. A badly inflamed bladder with impacted stones in the cystic duct; an old, thickened gall-bladder; a bladder distended with clear fluid; suspicious bladder malignancy; a strawberry gall-bladder with no stones and extensive pericholecystic adhesions should indicate a cholecystectomy. To take out the gall-bladder is not exactly comparable to an appendectomy. The former has a distinct function in accomplishing the concentration of hepatic bile and pancreatic juice. Continual bathing of the duodenum may serve in a reflex way to be responsible for the frequency of anacidity or even an achylia gastrica in these postoperative cases, to say nothing of other sequelæ. In common-duct strictures and pancreatitis it is often of distinct value to retain the bladder for future cholecyst-

duodenostomy or cholecystenterostomy purposes. The controversy in the matter of cholecystostomy *versus* cholecystectomy is not for us to decide, but we wish to put in a plea for the careful non-routine gall-bladder surgery. Such surgery is indicated in any case of early chronicity and stones. With the finding of one or more gall-stones in a relatively normal gall-bladder, further search should always be made for other abdominal pathology. A duodenal ulcer, for example, may be the real cause of trouble in such a patient. Sometimes in primary gall-bladder attacks operative interference may be required for gangrene, empyema and rarely perforation. Gall-bladder disease is seldom immediately dangerous, always remotely so. The appendix nearly always threatens life. An operation on the acute appendix nearly always relieves. In the case of the gall-bladder this is not always the case.

The surgeon always claims to prefer gall-bladder surgery only after a thorough medical treatment has failed. Such medical treatment at times is very successful while at other times it seems to be of little avail. The early institution of proper diet to control the gastric symptoms and to offset the intestinal stasis is often of prophylactic help in the purely inflammatory gall-bladder cases. Most of these patients are badly constipated and experience their worst attacks if intestinal peristalsis is cut down. We question the value of hexamethylenamin and salicylic acid as antiseptics in these cases. The cholagogues may have their therapeutic place here, but we believe what most of these agents accomplish is the release of gall-bladder bile into the duodenum, and that they do not especially influence bile formation. An active outdoor life seems to help many gall-bladder patients; on the other hand, there are times when exercise seems to aggravate acute attacks. In the light of Meltzer's theory infrequent and insufficient feeding may be conducive to biliary stasis and stone formation, so that frequent feeding perhaps promotes biliary drainage and helps infected cases. For the acute attack we know of nothing better than hot-packs, rest in bed and the judicious use of salines. In stone colic usually we, of course, need morphin and atropin. Experimentally, it is said that urotropin and iridin influence gall-stones. The same is said to be true of "Harrowgate old sulphur water," and barium chloride is supposed to stimulate the gall-bladder.

That gall-stones predispose to cancer is a point for much argument. It is true that a high percentage (70 to 90) of operated primary carcinoma cases of the gall-bladder is accompanied by stone. This is not true for primary duct carcinoma. Whether the stones do not frequently follow rather than precede the carcinomatous change in the gall-bladder is also a matter for dispute. Primary bladder malignancy is sometimes accompanied by stone formation, and there are cases which develop bladder cancer some years after stones have been removed or it may develop at the old cholecystos-

tomy site. Secondary carcinoma of the gall-bladder seldom is accompanied by stones because of the comparatively short duration of the disease and also because the invasion is by way of the serous coat of the bladder. It would seem rather that cancer of the gall-bladder is more prone to follow ulcerative processes and their consequent cicatrices than upon the mere presence of stones, just as we believe to be the case in gastroduodenal carcinoma.

In conclusion, we wish to emphasize the great difficulties of gall-bladder disease diagnosis in many cases. We have indicated some of the reasons why there is such difficulty. Frequently one must depend upon clinical intuition, and often William Mayo's dictum is realized upon "that where there is trouble in the right upper quadrant only a laparotomy will reveal the exact cause of the trouble." This should be true in fewer instances if we combine the evidence obtained by good, careful history-taking, physical examination, laboratory and roentgen-ray study. The case of long-standing indigestion, gas, eructation, etc., with perhaps interpolated acute abdominal attacks, is more or less typical, although the picture of gall-bladder disease is a variable one. The possibility of latent stones and some theories for gall-stone formation are mentioned. The relationship of cancer and gall-stones is indicated and some points are made in the controversy between those who practice cholecystotomy or cholecystectomy as an operation of choice. The study of duodenal contents is mentioned as a diagnostic aid and the practice of duodenal lavage in catarrhal jaundice and primary acute gall-bladder attacks is mentioned as a possible therapeutic measure. After any degree of gall-bladder chronicity is attained such lavage or medical measures are of little avail, and, indeed, frequently the problem is not met by surgery.

PHYSICAL EXERCISE IN HEART DISEASE.

By THEODORE B. BARRINGER, JR., M.D.,

NEW YORK.

(From the Cardiac Clinic of the New York Hospital.)

ONE of the important things which physicians have learned from their war experience is that physical exercise plays a dominant role in the hygiene of normal men and that certain circulatory disorders, variously termed *effort syndrome*, *neurocirculatory asthenia*, etc., may be benefited by the same measure. With no more than this experience it would seem reasonable to believe that a therapeutic measure as valuable as exercise has proved itself to be might be useful in circulatory disorders of a more serious nature.